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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/726,769	11/29/2000	Benjamin L. Furman	SWRI-2749A	1922

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EXAMINER

LE, HOA T

ART UNIT PAPER NUMBER

1773

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/726,769

Applicant(s)

FURMAN ET AL

Examiner

H. T. Le

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1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20, 27-32, 39-124 and 129-157 is/are pending in the application.
- 4a) Of the above claim(s) 27-32, 39-50, 76-85 and 113-124 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20, 51-75, 86-112 and 128-157 is/are rejected.
- 7) ☒ Claim(s) 9-14, 71-75, 132, 134, 141, 148, 152 and 153 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date June 03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicants requested that claims 76-85 be reinstated contending that it was part of the original group I invention and "at some point the examiner withdrew claims 76-85 from consideration". Claims 76-85 were withdrawn because a restriction of species had been made on claims 66-85 and applicants elected claims 66-75. Please review the restriction requirement mailed May 03, 2002, in particular page 4, paragraph 4 and applicants' election filed June 12, 2003, page 5, last paragraph. Accordingly, claims 76-85 stand withdrawn as directed to a non-elected invention.
2. Claims 45-50 have been amended to depend on the non-elected claims 39-44; therefore, they are hereby withdrawn from consideration as being directed to a non-elected invention.

### *Specification*

3. The disclosure is objected to because of the following informalities: The description at page 9, lines 5-10 is questionable. Akenyl groups require at least 2 carbon atoms by definition. How does applicant acquire an alkenyl group with just one carbon atom as defined there? Similar query is directed at the description at page 10, lines 1-2.

Appropriate correction is required.

### *Claim Objections*

4. Claims 9-14 stand objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim as set forth in the previous office action and further discussed below.

Applicant argued that claims 1 is directed to “functionalized zirconium oxide particles which “comprise” a “complexed fraction” and since “comprise” is an open-ended term, it would not exclude other forms of hydroxyl groups besides the “complexed fraction”. The issue is not what the language “comprise” permits. The issue is the structure of the claimed zirconium oxide particles. For simplicity and clarity, “total quantity of hydroxyl groups” is now referred to as “total quantity” and “complexed fraction of hydroxyl groups” is just “complexed fraction”. In claim 1, the phrase “a total quantity of hydroxyl groups comprising a complexed fraction of hydroxyl groups” signifies that the complexed fraction is being comprised in the total quantity, by which it means that all of the “complexed fraction” and all other non-specified components at most make up the total quantity, but cannot be more than the total quantity as the total quantity. In claim 9, however, the phrase “complexed fraction of hydroxyl groups comprises substantially all of said total quantity of hydroxyl groups” signifies that total quantity makes up the complexed fraction which means the complexed fraction may comprise all of the total quantity and more, which is the reverse of what has been defined in claim 1. It fails to further limit claim 1 for that reason. In other words, claim 1 defines “total quantity” as the larger group that contains the “complexed fraction” as a subgroup, yet claim 9 reverses this order because its language suggests that

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“total quantity” is a subgroup of the “complexed fraction”. Simply put, it is analogous as to state in an independent claim that “A contains B and more” and then in a dependent claim states, “B contains A and more”. That renders the dependent claim improper for failing to further limit the independent claim.

With regard to applicant’s footnote at page 31 of the response, the claim language of claim 7 is acceptable because it employs the word “is” instead of “comprises” (“complexed fraction of hydroxy groups is about 50% of said total quantity of hydroxyl groups” (emphasis added)). “is” does not define or suggest a relationship of a subgroup and a larger group. It just states how much of the complexed fraction is there in the total quantity.

5. Claims 71-75 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 66-70 upon which claims 71-75 respectively depend define “R1” as being one of “hydrolyzable alkyl groups”; however, claims 71-75 defines a broader “R1” as being just an “alkyl group”. Although the number of carbon atoms in the alkyl group is further limited to up to 9, it does not alter the fact that the “alkyl group” represented by R1 in claims 71-75 is broader than the “hydrolyzable alkyl group” as defined in claims 66-70.

6. Claims 132, 134, 141, 148, 152, are 153 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 128, 99, 104, 105, 106, and 142, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the

same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 112***

7. Claims 1-20, 51-75, 86-112, and 128-157 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 9, the antecedent basis of "said groups having a low steric hindrance" is unclear as no "groups" (in plural form) has been defined previously. If "said groups" is meant to refer to the low steric hindrance functionalities" at line 7 of the claim, the claim is further indefinite as it is unclear whether it means that the less reactive portion is complexed with the reactive portion if the reactive portion comprises a "low steric hindrance group". If so, does it mean the surfaces of the particles are complexes within their own functionalities. The claim is so unclear that an examination on its merit is nearly impossible.

Claim 9 is indefinite as the language employed here, in particular the word "comprises" (at line 2) renders it unclear as to whether the total quantity of hydroxyl groups contains the complexed fraction or the other way around which would have conflicted with the definition set forth in claim 1 upon which this claim depends. See also the "claim objections" section above for more detailed explanation.

Claims 10-14 suffer the same deficiency of claim 9.

Claim 86 suffers the same deficiency of claim 1.

Claims 51-55 are indefinite because they include a property that does not belong to the subject matter of the claim. The subject matter is "zirconium oxide particles", yet the property recited, namely "fracture toughness", is the property of a cured composite. The metes and bounds of the "cured composite" to which the property belongs is not clearly defined in the specification or in the claim. Further, it is unclear what constitutes a "fracture toughness" of the "composite" being referenced to. Any material or composite may possess certain "fracture toughness".

Claims 61-65 are deemed indefinite in view of their dependency on one of the indefinite claims 56-60.

Claim 66 is indefinite because it defines an alkenyl group that cannot exist. At line 7, it reads, "alkenyl groups having 1 or more carbon atoms". By definition, an alkenyl group requires at least two carbon atoms. Claim 66 is further indefinite in view of its dependency on claim 2.

Claims 67-70 suffer the same deficiency of claim 66.

Claims 71-75 are deemed indefinite in view of their dependency on one of the indefinite claims 66-70.

Claims 130 and 131 are deemed indefinite in view of their dependency on indefinite claims 66 and 70 respectively.

Claim 132 is a duplicate of claim 128. Line 2, "organofunctional groups" has no clear antecedent basis.

In claim 133, line 2, "organofunctional groups" has no clear antecedent basis.

Claim 134 is a duplicate of claim 99.

In claims 135-153, line 1, "metal oxide particles" lacks antecedent basis.

Claims 135-140, 144-147, 150 and 151 are further deemed indefinite in view of their dependency on one of the indefinite claims 66, 70, 71, 75, 130, 131.

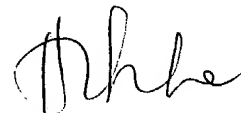
Claims 141 and 148 are substantial duplicate of claims 104 and 105, respectively.

Claims 152 and 153 are substantial duplicate of claims 106 and 142, respectively.

Other claims are deemed indefinite in view of their dependency on either claim 1 or 86.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 10:00 a.m. to 6:30 p.m., Mondays to Friday.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



H. T. Le  
Primary Examiner  
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